

PRESENTATIONS BY OWEN R. COOPER, UNIVERSITY OF COLORADO BOULDER

- 2021 **Cooper, O. R.**, An update on ever-changing global tropospheric ozone trends, **seminar**, Department of Meteorology and Geophysics, University of Vienna, Austria, March 2, 2021. Virtual presentation due to the Covid-19 pandemic.
- Cooper, O. R.**, K.-L. Chang, M. L. Serre, M. G. Schultz and J. J. West, A collaborative effort to build global ozone exposure maps from a fusion of observations and models, **Keynote Oral Presentation**, WMO GAW Symposium 2021, June 28 – July 2, 2021 (held virtually).
- Cooper, O. R.**, and R. S. Sokhi, WMO Air Quality and Climate Bulletin 2021 and its relationship with WHO Air Quality Guidelines, **Invited presentation**, Seminar on Air Quality and Health, MAP-AQ Asian Office Shanghai, November 30, 2021 (held virtually).
- Cooper, O. R.**, K.-L. Chang, I. Petropavlovskikh and P. Effertz, An update on variable and changing global tropospheric ozone trends, **Poster**, American Geophysical Union Fall Meeting, New Orleans, December, 13-17, 2021 (in person).
- 2020 **Cooper, O. R.** et al., Multi-Decadal Surface Ozone Trends at Globally Distributed Remote Locations, **Oral Presentation**, American Meteorological Society's 22nd Conference on Atmospheric Chemistry, AMS 100th Annual Meeting, January 12-16, 2020, Boston, MA.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report (TOAR): Accomplishments, Open Questions and New Frontiers, **seminar**, Department of Atmospheric Science, Colorado State University, February 6, 2020.
- Cooper, O. R.**, An overview of long-term tropospheric ozone trends, **Invited Oral Presentation**, Online LOTUS Workshop (Long-term Ozone Trends and Uncertainties in the Stratosphere, in support of the WMO/UNEP 2018 Ozone Assessment), May 28-29, 2020.
- Cooper, O. R.**, Achievements of TOAR-I and Goals of TOAR-II, **Oral Presentation**, TOAR-II Quickstart Event, held worldwide in virtual format, September 16, 2020.
- Cooper, O. R.**, Achievements of TOAR-I and Goals of TOAR-II, **Oral Presentation**, WMO GAW Joint Reactive Gases, Aerosols, and Total Atmospheric Deposition SAGs meeting, held worldwide in virtual format, September 24, 2020.
- Cooper, O. R.**, An update on ever-changing global tropospheric ozone trends, **seminar**, Department of Earth and Planetary Sciences, Harvard University, October 2, 2020. Virtual presentation due to the Covid-19 pandemic.
- Cooper, O. R.**, Benefits to uniformity of atmospheric ozone measurements, **Invited Oral Presentation**, BIPM Accurate Monitoring of Surface Ozone Virtual Workshop, 5-9 October 2020, held worldwide in virtual format due to the Covid-19 pandemic.
- Cooper, O. R.**, How we know tropospheric ozone is increasing (but not everywhere): New data and statistical approaches, **Invited virtual seminar**, Data Science of the Natural Environment (DSNE), Lancaster University, UK, October 29, 2020
- 2019 **Cooper, O. R.**, The Tropospheric Ozone Assessment Report (TOAR): Accomplishments, Open Questions and New Frontiers, **seminar**, Jülich Supercomputing Centre, Forschungszentrum Jülich, Germany, March 25, 2019.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report (TOAR): Accomplishments, Open Questions and New Frontiers, **seminar**, Institute for Advanced Sustainability Studies, Potsdam, Germany, March 29, 2019.
- Cooper, O. R.**, A. Gaudel, K.-L. Chang, M. G. Schultz, S. Schröder, V. Thouret, P. Nédélec, J. R. Ziemke and S. A. Strode, Northern Hemisphere tropospheric ozone increases since the mid-1990s: evidence from IAGOS, remote surface sites and OMI/MLS (2004-2018), 2019 Aura Science Team Meeting, Hilton Pasadena, Pasadena, California, August 27-29, 2019.
- 2018 **Cooper, O. R.**, The Tropospheric Ozone Assessment Report (TOAR): Presenting the world's largest database of ozone health metrics from 9000 monitoring sites worldwide, **poster**, Health Effects Institute, 2018 Annual Conference, Chicago, April 29–May 1.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report (TOAR): A community-wide effort to quantify tropospheric ozone in a rapidly changing world, **seminar**, Dept. of Atmospheric and Oceanic Sciences, Peking University, Beijing, July 2, 2018.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report (TOAR): A community-wide effort to quantify tropospheric ozone in a rapidly changing world, **seminar**, State Key Joint Laboratory of Environmental Simulation and Pollution Control, Peking University, Beijing, July 3, 2018.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report (TOAR): A community-wide effort to quantify tropospheric ozone in a rapidly changing world, **seminar**, Department of Earth System Science, Tsinghua University, Beijing, July 4, 2018.

- Cooper, O. R.**, The Tropospheric Ozone Assessment Report (TOAR): A community-wide effort to quantify tropospheric ozone in a rapidly changing world, *seminar*, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing, July 5, 2018.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report (TOAR): A community-wide effort to quantify tropospheric ozone in a rapidly changing world, *seminar*, Chinese Academy of Meteorological Science, China Meteorological Administration, Beijing, July 6, 2018.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report (TOAR): Presenting the world's largest database of ozone health metrics from 9000 monitoring sites worldwide, *oral presentation*, NASA Health and Air Quality Applied Sciences Team (HAQAST4) Meeting, Madison, WI, July 17, 2018.
- Cooper, O. R.**, et al., The Tropospheric Ozone Assessment Report (TOAR): A community-wide effort to quantify tropospheric ozone in a rapidly changing world, *Oral Presentation*, 2018 joint 14th iCACGP Quadrennial Symposium/15th IGAC Science Conference, Sept. 25, 2018, Takamatsu, Japan.
- 2017 **Cooper, O. R.**, The Tropospheric Ozone Assessment Report: A community-wide effort to quantify tropospheric ozone in a rapidly changing world, TEMPO Science Team Meeting, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, May 31, 2017.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report (TOAR): A community-wide effort to quantify tropospheric ozone in a rapidly changing world, *Invited talk*, OMI Science Team Meeting, NASA Goddard Space Flight Center, Greenbelt, Maryland, September 14, 2017.
- Cooper, O. R.**, Tropospheric ozone observations across Asia: A synthesis of recent findings and implications for domestic and downwind regions, *Invited Oral Presentation*, American Geophysical Union Fall Meeting, New Orleans, December, 11-15, 2017.
- Cooper, O. R.**, et al., The Tropospheric Ozone Assessment Report (TOAR): A community-wide effort to quantify tropospheric ozone in a rapidly changing world, *Oral Presentation*, American Geophysical Union Fall Meeting, New Orleans, December, 11-15, 2017.
- 2016 **Cooper, O. R.**, The Tropospheric Ozone Assessment Report: A community-wide effort to quantify tropospheric ozone in a rapidly changing world, *Keynote Talk*, 2016 Quadrennial Ozone Symposium, Edinburgh, Scotland, September 5, 2016.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report: A community-wide effort to quantify tropospheric ozone in a rapidly changing world, *Invited seminar*, University of Cambridge Centre for Climate Science, U. K., September 2, 2016.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report: A community-wide effort to quantify tropospheric ozone in a rapidly changing world, *Invited seminar*, Department of Chemistry, University of York, U. K., September 7, 2016.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report: A community-wide effort to quantify tropospheric ozone in a rapidly changing world, *Department Seminar*, Gillings School of Global Public Health, The University of North Carolina at Chapel Hill, October 13, 2016.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report: A community-wide effort to quantify tropospheric ozone in a rapidly changing world, *Invited seminar*, Nicholas School of the Environment, Duke University, October 14, 2016.
- Cooper, O. R.**, IGAC's Tropospheric Ozone Assessment Report (TOAR): Facilitating international research on ozone's impact on public health, vegetation and climate change, *Invited seminar*, Innovation Center of the Catholic University, Santiago, Chile, March 17.
- Cooper, O. R.**, Ozone pollution in the United States: The success of emissions controls and new challenges from international and stratospheric ozone sources, *Invited seminar*, Center for Climate and Resilience Research, Santiago, Chile, March 18.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report: A community-wide effort to quantify tropospheric ozone in a rapidly changing world, *poster*, 2016 IGAC Science Conference, Breckenridge, September 26-30.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report: A community-wide effort to quantify tropospheric ozone in a rapidly changing world, *invited seminar*, Nanjing University, Nanjing, China, November 21.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report: A community-wide effort to quantify tropospheric ozone in a rapidly changing world, *invited seminar*, Shandong University, Jinan, China, November 22.
- Cooper, O. R.**, The Tropospheric Ozone Assessment Report: A community-wide effort to quantify tropospheric ozone in a rapidly changing world, *invited seminar*, Hong Kong Polytechnic University, Hong Kong, China, November 24.

- 2015 **Cooper, O. R.**, *Invited* Participant in the Transboundary Ozone Pollution Conference, Tenaya Lodge, Yosemite National Park, March 31 – April 2, 2015. Sponsored by the San Joaquin Valley Air Pollution Control District with participation from the NASA Air Quality Applied Sciences Team
- Cooper, O. R.**, Global distribution and trends of tropospheric ozone: An observation-based review, *Invited* seminar, University of Virginia, Department of Environmental Sciences, October 29, 2015.
- Cooper, O. R.**, Intercontinental pollution transport and its impact on the western United States, *Invited* talk, Air Quality Research Subcommittee, Department of Commerce, Washington DC, February 19, 2015.
- Cooper, O. R.**, Update on trends in background ozone concentrations, *Invited*, Modeling Air Quality from the Global to Local Scale, NCAR Center Green, Boulder, May 11-15, 2015.
- Cooper, O. R.**, TOAR: an overview of the Tropospheric Ozone Assessment Report, *Invited*, Modeling Air Quality from the Global to Local Scale, NCAR Center Green, Boulder, May 11-15, 2015.
- Cooper, O. R.**, TOAR: an overview of the Tropospheric Ozone Assessment Report, *Invited*, Chemistry Climate Model Initiative (CCMI) workshop, Rome, Italy, October 7-9, 2015.
- Cooper, O. R.**, TOAR: an overview of the Tropospheric Ozone Assessment Report, and the role of TOLNet, *Invited*, Second Annual Tropospheric Ozone Lidar Network (TOLNet) Working Group Meeting, NOAA ESRL, Boulder, June 16-18, 2015.
- Cooper, O. R.**, An Overview of IGAC's Tropospheric Ozone Assessment Report (TOAR) and an update on North American ozone trends, *Poster*, SPARC Regional Workshop: Chemical and Physical Processes in the Climate System, 9-10 November 2015, NCAR Foothills Laboratory, Boulder.
- 2014 **Cooper, O. R.**, Global distribution and trends of tropospheric ozone: An observation-based review, *Invited* oral presentation, Global Change Seminar Series, School of GeoSciences, University of Edinburgh, Scotland, April 4, 2014.
- Cooper, O. R.**, Global distribution and trends of tropospheric ozone: An observation-based review, *Invited* oral presentation, MOZAIC-IAGOS Scientific Symposium on Atmospheric Composition Observation by Commercial Aircraft, Toulouse, France, 12-16 May, 2014.
- Cooper, O. R.**, Global distribution and trends of tropospheric ozone: An observation-based review, *Invited* oral presentation, NCAR Advanced Study Program Seminar Series, Boulder, March 19, 2014.
- Cooper, O. R.**, "IPCC AR5 Chapter 2. Observations: Atmosphere & Surface", *Invited* oral lecture in the CIRES/ATOC Seminar Series: Reading the IPCC Report, CIRES, University of Colorado, Boulder, September 9, 2014.
- Cooper, O. R.**, Inflow processes over Western North America, *Invited* oral presentation, Joint Workshop of AQMEII3 and TF HTAP, U.S. EPA, Research Triangle Park, NC, October 30, 2014.
- Cooper, O. R.**, Global distribution and trends of tropospheric ozone: An observation-based review, *Poster*, CCMI (Chemistry-Climate Model Initiative) Workshop, Lancaster, UK, 20-22 May, 2014.
- Cooper, O. R.**, An overview of the new Tropospheric Ozone Assessment Report (TOAR), *Poster*, 13th IGAC Science Conference on Atmospheric Chemistry, Natal, Brazil, 22-26 September, 2014.
- Cooper, O. R.**, Global distribution and trends of tropospheric ozone: An observation-based review, *Poster*, CIRES Science Rendezvous, University of Colorado, Boulder, May 2, 2014.
- 2013 **Cooper, O. R.**, Long-term ozone trends at rural ozone monitoring sites across the United States, 1990-2010, Chemical Sciences Division Seminar, NOAA ESRL, Boulder, January 16, 2013.
- Cooper, O. R.**, Long-term ozone trends at rural ozone monitoring sites across the United States, 1990-2010, *Invited* Oral Presentation, Harvard School of Engineering and Applied Sciences Environmental Science and Engineering Seminar, Harvard University, Cambridge, March 8, 2013.
- Cooper, O. R.**, Inflow processes influencing air quality over Western North America, *Invited* oral presentation, Meeting of the Task Force on Hemispheric Transport of Air Pollution, March 20-22, 2013, Geneva, Switzerland.
- Cooper, O. R.**, Global surface ozone trends, a synthesis of recently published findings, oral presentation, IGAC/SPARC Chemistry-Climate Model Initiative (CCMI) 2013 Science Workshop, May 14-16, 2013, NCAR, Boulder.
- Cooper, O. R.**, Global surface ozone trends, a synthesis of recently published findings, oral presentation, NOAA GMD Global Monitoring Annual Conference, May 21-22, 2013, Boulder.
- Cooper, O. R.**, Status of IAGOS in the USA Working Group, *Invited* Oral Presentation at the IAGOS Annual Meeting, San Lorenzo del Escorial, Spain, June 12-14, 2013
- 2012 **Cooper, O. R.**, Western US ozone trends, 1990-2010, *Invited* Oral Presentation, WESTAR Council & the University of Nevada Conference on Western Ozone Transport, October 10-12, 2012, Reno.
- Cooper, O. R.**, Ozonesonde and aircraft measurements during CalNex, *Invited* Oral Presentation, WESTAR Council & the University of Nevada Conference on Western Ozone Transport, October 10-12, 2012, Reno.

- Cooper, O. R.**, R. Gao, D. Tarasick, T. Leblanc and C. Sweeney, Long-term ozone trends at rural ozone monitoring sites across the United States, 1990-2010, Poster Presentation, American Geophysical Union Fall Meeting, San Francisco, December 3-7, 2012.
- 2011 **Cooper, O. R.**, A. Volz-Thomas, and J.-P. Cammas, IAGOS in the USA: An opportunity for commercial airlines to monitor air quality and greenhouse gases above the United States, oral presentation, First Annual Aviation Climate Change Research Initiative (ACCRI) Symposium, Atlanta, February 22-24, 2011.
- Cooper, O. R.**, C. Sweeney, A. Volz-Thomas, and J.-P. Cammas, IAGOS in the USA: An opportunity for commercial airlines to monitor air quality and greenhouse gases above the United States, poster presentation, CIRES Science Rendezvous, April 22, 2011, Boulder.
- Cooper, O. R.**, S. J. Oltmans, B. J. Johnson, J. Brioude, W. Angevine, M. Trainer, D. D. Parrish, T. R. Ryerson, I. Pollack, P. D. Cullis, M. A. Ives, D. W. Tarasick, J. Al-Saadi, and I. Stajner, Measurement of Western U.S. Baseline Ozone from the Surface to the Tropopause and Assessment of Downwind Impact Regions, oral presentation, 39th NOAA ESRL Global Monitoring Annual Conference, May 17-18, 2011, Boulder.
- Cooper, O. R.**, A. Volz-Thomas, and J.-P. Cammas, IAGOS in the USA: An opportunity for commercial airlines to monitor air quality and greenhouse gases above the United States, *Invited Oral Presentation*, AIAA Hawaii Conferences, The Science Underpinning Aviation Impacts on the Environment, Honolulu, June 28, 2011.
- Cooper, O. R.**, IAGOS in the USA: progress report, *Invited Speaker*, IAGOS-ERI Annual Meeting, Manchester, U.K., September 12 – 14, 2011.
- Cooper, O. R.**, Long range transport impacts on ozone air quality in the western United States, *Invited Seminar Speaker*, Department of Atmospheric and Oceanic Sciences, University of Colorado at Boulder, October 28, 2011.
- Cooper, O. R.**, Long range transport impacts on California's ozone air quality, *Invited Oral Presentation*, American Geophysical Union Fall Meeting, San Francisco, 2011.
- 2010 **Cooper, O. R.**, Increasing springtime ozone mixing ratios in the free troposphere over western North America, Chemical Sciences Division Seminar, NOAA ESRL, Boulder, *Invited*, Feb 3, 2010.
- Cooper, O. R.**, S. J. Oltmans, B. J. Johnson, M. Trainer, D. D. Parrish, T. R. Ryerson, I. Pollack, Patrick Cullis, M. A. Ives, D. W. Tarasick, J. Al-Saadi, I. Stajner, First multi-site assessment of tropospheric baseline ozone along the U.S. west coast, oral presentation, American Geophysical Union Fall Meeting, San Francisco, 2010.
- 2009 **Cooper, O. R.**, The influence of lightning NO_x emissions on the summertime North American upper tropospheric ozone maximum, *Invited talk* at the Fourth Conference on the Meteorological Applications of Lightning Data, 89th American Meteorological Society, Annual Meeting, 11–15 January, 2009, Phoenix.
- Cooper, O. R.**, D. D. Parrish, A. Stohl, M. Trainer, P. Nedelec, V. Thouret, J. P. Cammas, S. J. Oltmans, B. J. Johnson, D. Tarasick, T. LeBlanc, I. S. McDermid, D. Jaffe, R. Gao, J. Stith, T. Ryerson, K. Aikin, T. Campos, A. Weinheimer, and M. Proffitt, Increasing mid-tropospheric ozone above western North America during springtime, oral presentation, NOAA/ESRL Global Monitoring Annual Conference, May 13-14, 2009, Boulder.
- Cooper, O. R.**, D. D. Parrish, A. Stohl, M. Trainer, P. Nedelec, V. Thouret, J. P. Cammas, S. J. Oltmans, B. J. Johnson, D. Tarasick, T. LeBlanc, I. S. McDermid, D. Jaffe, R. Gao, J. Stith, T. Ryerson, K. Aikin, T. Campos, A. Weinheimer, and M. Proffitt, Increasing mid-tropospheric ozone above western North America during springtime, oral presentation, Tropospheric Ozone Changes: Observations, state of understanding, and modeling requirements Workshop at NOAA/ESRL, Boulder, October 14-16, 2009.
- 2008 **Cooper, O. R.**, S. Eckhardt, J. H. Crawford, C. C. Brown, R. C. Cohen, T. H. Bertram, P. Wooldridge, A. Perring, W. H. Brune, X. Ren, D. Brunner, and S. L. Baughcum, The summertime buildup and decay of lightning NO_x and aged thunderstorm outflow above North America, oral presentation, American Geophysical Union Fall Meeting, San Francisco, 2008.
- 2007 **Cooper, O. R.**, Evidence for a recurring eastern North America upper tropospheric ozone maximum during summer, *Invited Seminar Speaker*, Atmospheric Science Department, The University of Alabama in Huntsville.
- Cooper, O. R.**, Tropospheric Ozone: Global distribution and radiative forcing, speaker at the NOAA ESRL Theme Presentation: Radiative Forcing of Climate by non-CO₂ Atmospheric Gases, NOAA Earth System Research Laboratory, Boulder.

- Cooper, O. R.**, M. Trainer, A. M. Thompson, S. J. Oltmans, D. W. Tarasick, J. C. Witte, A. Stohl, S. Eckhardt, J. Lelieveld, M. J. Newchurch, B. J. Johnson, R. W. Portmann, L. Kalnajs, M. K. Dubey, T. Leblanc, I. S. McDermid, G. Forbes, D. Wolfe, T. Carey-Smith, G. A. Morris, B. Lefer, B. Rappenglück, E. Joseph, F. Schmidlin, J. Meagher, F. C. Fehsenfeld, T. J. Keating, R. A. Van Curen and K. Minschwaner, Evidence for a recurring eastern North America upper tropospheric ozone maximum during summer, oral presentation, American Geophysical Union Fall Meeting, San Francisco, 2007.
- Cooper, O. R.**, A. Stohl, M. Trainer, A. Thompson, J. C. Witte, S. J. Oltmans, G. Morris, K. E. Pickering, J. H. Crawford, G. Chen, R. C. Cohen, T. H. Bertram, P. Wooldridge, A. Perring, W. H. Brune, J. Merrill, J. L. Moody, D. Tarasick, P. Nédélec, G. Forbes, M. J. Newchurch, F. J. Schmidlin, B. J. Johnson, S. Turquety, S. L. Baughcum, X. Ren, F. C. Fehsenfeld, J. F. Meagher, N. Spichtinger, C. C. Brown, S. A. McKeen, I. S. McDermid and T. Leblanc, Large upper tropospheric ozone enhancements above mid-latitude North America during summer: In situ evidence from the IONS and MOZAIC ozone monitoring network, *invited talk* at the NOAA Office of Oceanic and Atmospheric Research's Senior Research Council, Chantilly, Virginia, December 4, 2007.
- Cooper, O. R.**, Observational evidence of tropospheric ozone trends in North America: Three contributions from NOAA/ESRL, Joint TFHTAP (Task Force on Hemispheric Transport of Air Pollutants) and WMO (World Meteorological Organization) Workshop on Integrated Observations for Assessing Hemispheric Air Pollution, 24-26 January 2007, World Meteorological Organization Headquarters, Geneva, Switzerland.
- 2006 **Cooper, O. R.**, A. Stohl, M. Trainer, A. Thompson, J. C. Witte, S. J. Oltmans, G. Morris, K. E. Pickering, J. H. Crawford, G. Chen, R. C. Cohen, T. H. Bertram, P. Wooldridge, A. Perring, W. H. Brune, J. Merrill, J. L. Moody, D. Tarasick, P. Nédélec, G. Forbes, M. J. Newchurch, F. J. Schmidlin, B. J. Johnson, S. Turquety, S. L. Baughcum, X. Ren, F. C. Fehsenfeld, J. F. Meagher, N. Spichtinger, C. C. Brown, S. A. McKeen, I. S. McDermid and T. Leblanc, Influence of lightning NO_x on the summertime upper tropospheric ozone enhancement above eastern North America, *Invited talk*, American Geophysical Union Fall Meeting, San Francisco, 2006.
- 2005 **Cooper, O. R.**, A. Stohl, G. Hübler, E. Y. Hsie, D. D. Parrish, A. F. Tuck, G. N. Kiladis, S. J. Oltmans, B. J. Johnson, M. Shapiro, J. L. Moody and A. S. Lefohn, Direct transport of mid-latitude stratospheric ozone into the lower troposphere and marine boundary layer of the tropical Pacific Ocean, *Invited talk*, NOAA Aeronomy Lab Seminar Speaker, Feb. 9, 2005.
- Cooper, O. R.**, A. Stohl, G. Hübler, E. Y. Hsie, D. D. Parrish, A. F. Tuck, G. N. Kiladis, S. J. Oltmans, B. J. Johnson, M. Shapiro, J. L. Moody and A. S. Lefohn, oral presentation, Direct transport of mid-latitude stratospheric ozone into the lower troposphere and marine boundary layer of the tropical Pacific Ocean, European Geosciences Union, General Assembly 2005, Vienna.
- Cooper, O. R.**, A. Stohl, G. Hübler, E. Y. Hsie, D. D. Parrish, A. F. Tuck, G. N. Kiladis, S. J. Oltmans, B. J. Johnson, M. Shapiro, J. L. Moody and A. S. Lefohn, oral presentation, Direct transport of mid-latitude stratospheric ozone into the lower troposphere and marine boundary layer of the tropical Pacific Ocean, Joint SPARC/IGAC UTLS Workshop: Processes governing the chemical composition of the mid-latitude UTLS, 18-20 May 2005, Max Planck Institute for Chemistry, Mainz, Germany.
- Cooper, O. R.**, A. Stohl, M. Trainer (presenter), A. Thompson, J. C. Witte, S. J. Oltmans, B. J. Johnson, J. Merrill, J. L. Moody, G. Morris, D. Tarasick, G. Forbes, P. Nédélec, F. C. Fehsenfeld, J. Meagher, M. J. Newchurch, F. J. Schmidlin, S. Turquety, J. H. Crawford, K. E. Pickering, R. C. Cohen, T. Bertram, P. Wooldridge, and W. H. Brune, oral presentation, Large upper tropospheric ozone enhancements above mid-latitude North America during summer: In situ evidence from the IONS and MOZAIC ozone monitoring network, American Geophysical Union Fall Meeting, San Francisco, 2005.
- Cooper, O. R.**, Anomalous tropospheric ozone events influenced by natural processes: The North American upper tropospheric ozone maximum and stratospheric intrusions above Hawaii, *invited talk* to the Oslo Climate Group Distinguished Lecture Series, Oslo, Nov. 15, 2005.
- Cooper, O. R.**, Anomalous tropospheric ozone events influenced by natural processes: The North American upper tropospheric ozone maximum and stratospheric intrusions above Hawaii, *Invited talk*, Norwegian Institute for Air Research, Kjeller, Nov. 24, 2005.
- 2004 **Cooper, O. R.**, A. Stohl, S. Eckhardt, S. Oltmans, and B. Johnson, Anthropogenic NO_x emissions, transport pathways, and their relationship to ozone profiles on the west and east coasts of the United States, *invited talk*, MOZAIC-III Final Meeting, January 14-16, 2004, Carcassonne, France.
- Cooper, O. R.**, A. Stohl, S. Eckhardt, D. D. Parrish, S. Oltmans, B. Johnson, P. Nédélec, F. J. Schmidlin, M. J. Newchurch, Y. Kondo and K. Kita, poster presentation, A springtime comparison of

- tropospheric ozone and transport pathways on the east and west coasts of the United States, 2004 IGAC Meeting, Christchurch, New Zealand.
- 2003 **Cooper, O. R.**, Current understanding of vertical and long-range transport through extratropical cyclones, *invited seminar* at the EGS-AGU-EUG Joint Assembly, Nice, France.
- Cooper, O. R.**, North American trace gas import and export: The role of mid-latitude cyclones, *invited seminar*, Harvard University, Cambridge, Massachusetts.
- Cooper, O. R.**, North American trace gas import and export: The role of mid-latitude cyclones, *invited seminar*, NOAA Climate Monitoring and Diagnostics Laboratory, Boulder, Colorado.
- Cooper, O. R.**, Transport mechanisms controlling North American trace gas import and export, *invited seminar*, Michigan Technical University, Houghton.
- Cooper, O. R.** and A. Stohl, FLEXPART particle dispersion modeling and forecasting during NENA-2004, oral presentation at the 2004 Climate and Air Quality Meeting, University of New Hampshire, Durham.
- Cooper, O. R.**, C. Forster, D. Parrish, E. Dunlea, G. Hübler, F. Fehsenfeld, J. Holloway, S. Oltmans, B. Johnson, A. Wimmers, and L. Horowitz, On the life-cycle of a stratospheric intrusion and its dispersion into polluted warm conveyor belts, oral presentation at the Fall meeting of the American Geophysical Union, San Francisco.
- 2002 **Cooper, O. R.**, C. Forster, D. Parrish, M. Trainer, E. Dunlea, T. Ryerson, G. Huebler, F. Fehsenfeld, D. Nicks, J. Holloway, J. Moody, A comparison of airstream trace gas signatures upwind and downwind of North America, oral presentation at AGU Fall Meeting, San Francisco.
- Cooper, O. R.**, A. Stohl, D. Parrish, M. Trainer, S. Oltmans, and B. Johnson, Stratospheric and tropospheric source regions of ozone entering the western United States troposphere, oral presentation at the BMU/UBA – USEPA-EMEP Workshop, Bad Breisig, Germany.
- Cooper, O. R.**, A. Stohl, D. Parrish, M. Trainer, S. Oltmans, and B. Johnson, Stratospheric and tropospheric source regions of ozone entering the western United States troposphere, poster presentation at the Joint CACGP/IGAC International Symposium, Heraklion, Crete.
- 2001 **Cooper, O. R.**, J. L. Moody, D. Parrish, M. Trainer, T. B. Ryerson, J. S. Holloway, G. Hübler, F. C. Fehsenfeld, M. J. Evans, A. Stohl, poster presentation, Trace Gas Composition of Mid-Latitude Cyclones over the Western North Atlantic Ocean: A Conceptual Model, AGU Spring Meeting, Boston.
- Cooper, O. R.**, *invited seminar*, Trace Gas Composition of Mid-Latitude Cyclones over the Western North Atlantic Ocean: A Conceptual Model, invited seminar at Deutsches Zentrum für Luft- und Raumfahrt, Institut für Physik der Atmosphäre, Oberpfaffenhofen, Germany.
- Cooper, O. R.**, *invited seminar*, Trace Gas Composition of Mid-Latitude Cyclones over the Western North Atlantic Ocean: A Conceptual Model, invited seminar at Rudjer Boskovic Institute, University of Zagreb, Croatia.
- 2000 **Cooper, O. R.**, Trace gas signatures of the airstreams within North Atlantic cyclones - Case studies from the NARE'97 aircraft intensive, seminar presented at the NOAA Aeronomy Laboratory, Boulder, March.
- Cooper, O. R.**, J. L. Moody, D. D. Parrish, M. Trainer, and S. J. Oltmans, Trace gas signatures of the transport sectors within a typical North Atlantic cyclone, 80th AMS Annual Meeting, Long Beach, January.
- 1999 **Cooper, O. R.**, J. L. Moody, A. J. Wimmers, K. P. Higgins, J. T. Merrill, A. I. Prados, R. R. Dickerson, and S. J. Oltmans, Temporal and spatial evolution of a tropopause fold and associated trace gas signatures over the eastern United States and Western North Atlantic Ocean, oral presentation at the 79th AMS Annual Meeting, Dallas, January.
- Cooper, O. R.**, J. L. Moody, D. D. Parrish, M. Trainer, and S. J. Oltmans, Frequency, origin, and chemical composition of stratospheric intrusions over the western North Atlantic Ocean, autumn 1997, (poster) AGU Fall Meeting, San Francisco, December.
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